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THE  
*Deposited April 12. 1844*  
FAMILY DIRECTOR:

DESIGNED

AS A HELP TO THOSE, WHO ARE SUPPLYING THEMSELVES, IN  
WHOLE OR IN PART, WITH WOOLLEN GOODS OF THEIR  
OWN MANUFACTURE.

CONTAINING

PLAIN DIRECTIONS, FOR WASHING WOOL, COLOURING WOOL, WOOLLEN YARN  
AND FLANNEL, AND MIXING OF COLOURS.

ALSO,

DIRECTIONS FOR CARDING, SPINNING, WEAVING, FULLING,  
AND FINISHING.

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BY MATTHEW ATKINSON.

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S. CARROLLTON

PRINTED BY JOHN HULLEN.

1844.

U.S. District Court, District of Ohio

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## PREFACE.

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The Family Director has been got up and conducted throughout, with direct reference to the interest of that portion of the public, who are supplying themselves in whole, or in part, with Woollen Goods of their own manufacture.

The author has been induced to believe that, he could be useful, to this class of his fellow citizens, from several considerations. Upwards of thirty years experience, in the business of Fulling, and Dying, has acquainted him, to a considerable extent, with the different processes by which wool is most advantageously converted, into the several articles in common use. The great advantage of making the colours in the wool, instead of being dyed in the web, is every day becoming more evident to the public; whilst the almost entire impossibility of obtaining correct information, in this important branch of home industry, confines those who are most interested to a few colours only, and even those are frequently not well fixed, for want of a more general acquaintance with the art of dyeing.

The author is acquainted with no book designed to fill the place, intended for the Family Director.

All the authors on colours, of which he has any knowledge, have written almost exclusively for the benefit of practitioners; and many of them did not intend to be understood, even by dyers, unless they were scientifically acquainted with their business.

The author has indulged the opinion for many years, that, a work of this kind could be adapted to the use of Farmers, Mechanics and others, to such an extent, as to enable them to succeed in dying permanently on wool, and yarn, all the different colours in general use, in the manu-

facture of Cloths, Satinetsts, Linseys, Flannels, Coverletts, and Carpeting.

With this in view, he has given the process, with all the directions necessary, for making each colour specified in the work, in that plain manner, which he feels confident will be understood by all.

In order to render the work as useful as possible, the several preparations of Tin, as used by dyers, are minutely described, together with the proper directions for using these compositions in dying, so that, those who wish to make the brightest and most beautiful shades of red, crimson, orange, green, and yellow, may be at no loss for the information that is necessary.

In view of the bad consequences, resulting to our home manufacturing, from bad management in washing wool, carding, spinning, and weaving, and from bad fulling and finishing, the author has paid particular attention, in the work, to each of these branches, and given those directions, which, if attended to, will result to the entire satisfaction of those concerned.

To those engaged in the business of Fulling, Dying, and Finishing, it may be remarked that, although the Family Director is not designed for their exclusive benefit, they may realize some advantage by consulting its pages.

*Carrollton, January 1, 1844.*



# THE FAMILY DIRECTOR.

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The first thing needed in colouring, is a suitable vessel in which to prepare the dye and make the colour. The size ought to be such as to afford at least three gallons of dye, for each pound of cloth, flannel or yarn; and for wool not less than five. With less room than this it is hardly possible to make colours evenly.

For all colours in which copperas is used, an iron kettle will answer the purpose. Those colours, in which copperas is not used, must be dyed in copper kettles.

To make colours evenly on cloth, flannels or yarn, a reel is indispensable; which can hardly be put up in a common fire-place. For this reason, it would be preferable to set the kettle out of doors, in any way that it will stand firmly, and admit, below, sufficient fire to make it boil in reasonable time.

A reel can then be put up in a temporary way, by setting a fork firmly on each side of the kettle, so that the reel will cross at the centre, and about a foot above the top of the kettle.

For colouring wool, a board should be placed firmly in such a position, as to run the dye back into the kettle, as it drains from the wool when taken up to cool.

For colouring in small lots, the reel may be quite light; say inch and a half square scantling for the axle, through which bore two half-inch holes, at such distance apart, as just to be inside your kettle when laid across the top, turn over the scantling and bore two other holes just inside the first, and at right angles with them, through which drive four pins six inches in length, and on the points attach four laths, extending a few inches in length beyond the pins at each end. Attach a crank to the end of the axle about eight inches in length, and dress the journals round, that the reel may run smoothly; and you have a reel for about two hours work, that will last many years if laid aside with care when out of use.

When all is ready and your cloth or yarn smoothly folded on a board, such as described for colouring wool; pass one end of the web over the reel, and turn with one hand, and with a short stick in the other hand, sink the web in the dye as you reel it over; let this be done quickly, when all is in, take up the end of the web, pass it over the reel, and turn back slowly; opening the cloth on the reel to give it air; continue this process of reeling back and forward, and opening, while the goods are in the dye; this constant reeling and airing is done to prevent spotting; when the goods have been in the dye a proper length of time, slip one end of the web between the axle, and a rib, of the reel; and turn in a direction opposite to the board, on which you pile the cloth, and when the cloth or yarn is reeled out, let it drain. Then with one hand turn the reel back, and with the stick in the other hand, throw off the cloth in a pile on the board; then fold the cloth to air and cool.

When yarn is coloured, the skeins are shook out loose. You commence with two of the skeins by passing a string through them, and tying it so loosely that, when stretched they will be about three inches apart; to this, attach the next skein in the same way, and so proceed until all are thus united. You can then, by the help of the reel, handle the yarn in the same way that cloth is managed, without danger of spotting or tangling.

All barks, woods &c., used in the preparation of dyes, in which wool or yarn is coloured, should be carefully taken out of the kettle before the goods are put in. Hence to save trouble, those articles are put in bags; and boiled in the dye, old coffee sacks are about as good as any; when Madder or Camwood is used they may in all cases be put loose in the dye, except in colouring wool, for this use the dye must be cleared of all substances that does not dissolve in boiling water, before the wool is dipped. Hence a difficulty arises in the use of both these valuable articles; if put loose in the dye they adhere to the wool, and are injurious in carding and spinning, and if confined in cloths or sacks, they pack so closely together that their colouring matter is not given out in the dye. As browns, however, are almost the only colours, in which madder and camwood are used for dying on wool; this difficulty may be removed by boiling them loose in the dye, and then letting it stand a few hours, the Madder or Camwood, as the case may be, will settle to the bottom, the dye can be poured off, the grounds put in a cloth of open texture, and with a few pails full of warm water applied to them, the whole of the colour they contain, strained into the dye. There is a little trouble about this, but not so much as attends bad rolls, and bad yarn.

In order to make good colours, the goods intended to be dyed, should be perfectly clean; when this is not attended to, there is always a waste of dyestuff, and bad colours.

There are several advantages in making colours in the spring, of which those who do but little in this way, should avail themselves; the weather is commonly pleasant, and favorable for dying, water is plenty for washing or rinsing, in many places when it cannot be had in the fall season; and in many places, water is purer and better for dying bright colours in the spring, than any other time in the year; and if barks be used they are easier procured, and many of them make better colours than in the fall or winter.

### **No. 1. For Black with Black-Oak Bark.**

Five pounds of Wool: Put three pecks Black-Oak bark cut fine, in any kind of a bag that is of open texture, and boil it one and a half hours; then take it out, and dissolve half a pound copperas, and three ounces blue vitriol, in hot water and add to the dye, stir well and dip the wool, mix it well that the colour may be evenly; boil slowly one hour, then take out and cool the wool; dip it again and stir and mix the wool well and let it stand in the dye over night; next morning take out the wool, and empty



the dye; fill with clean water and add two pounds good Logwood; which must be boiled in a sack for at least two hours, dissolve half a pound copperas and two ounces blue vitriol, take up the Logwood, and add the copperas and vitriol with half a gallon chamberlye, mix well, then dip the wool, and mix well to make the colour evenly; boil slowly for one hour and let stand over night, next day, take out the wool, and rinse it well in clean water. This makes a full and durable black, the black-oak bark binds the colour and leaves it easy to wash—for yarn one fourth less dye-stuffs will be sufficient.

### **No. 2. For Black, with Pin-Oak Bark.**

Five pounds of Wool: fill your dye-kettle within a few inches of the top, with clean water, and add half a bushel pin-oak bark, cut fine, and tied up in a cloth of open texture; boil well two hours, take out the bark and dissolve three quarters of a pound of Copperas, and add to the dye; stir well and dip the wool, boil slowly one hour, mix the wool carefully with the dye in order to make the colour evenly, then take out and air and cool the wool; fill up the kettle again, and dip the wool, boil slowly half an hour, and let it remain over night in the dye, without any more boiling; next day take out the wool, empty the kettle and fill as before with clean water, add two pounds good Logwood in chips, and one peck white-oak bark; boil well one and half hours, rinse the wool in clean water and take out the bark and Logwood; dissolve half a pound copperas, and three ounces blue vitriol, and add to the dye, mix well and dip the wool, boil slowly one hour, then take up the wool, air and cool it; fill up the kettle, and dip again; mix the wool well in the dye, boil slowly one hour, and let the wool remain in the dye over night, next day take it out and rinse well, and dry as soon as convenient.

### **No. 3. Black with Walnut Bark.**

Five pounds of Wool; dye the wool a good walnut brown, then boil two pounds Logwood, and one peck white-oak bark two hours, take them out of the dye, and add three-quarters of a pound copperas, and one fourth pound blue vitriol; have them dissolved and well mixed in the dye, then dip the wool, and boil slowly one hour, stirring the wool frequently in the dye, then take it up, air and cool it, and fill up the kettle; dip the wool again, and boil slowly half an hour; let the wool remain in the dye over night without any more boiling, next day take out and rinse it clean and dry it.

Either of the three foregoing receipts, will dye a full and beautiful black, and permanent as black can be made, without having recourse to the blue-dye.

### **No. 4. Blue Black.**

Five pounds of Wool; boil for two hours, one peck white-oak bark, and one and a half pounds black-oak bark, ground as for tanning, then take out

the bark, and dissolve three-fourths of a pound copperas and two ounces blue vitriol, and add to the dye, stir well and dip the wool, and boil slowly one hour; then take up the wool, air, and cool it, fill up the kettle and dip the wool again, mix it well, boiling slowly half an hour; and let it remain in the dye over night; next morning take up the wool, empty, clean the kittle, and fill with clean water; to which add two and half pounds Logwood, boil well one and a half hours, take out the Logwood, and dip the wool and mix well with the dye, and boil slowly one hour; take up the wool and cool it, fill up the kettle, and dissolve one-fourth of a pound of copperas, and one ounce blue vitriol, and add to the dye, with half a gallon chamberlye; dip the wool and boil slowly half an hour, and let it remain over night in the dye; then take out, wash and dry it.

A better black is made and less injury did to the goods, by adopting the plan laid down in the preceding receipts; viz: dying the color in part, and commencing a new dye to finish in, than can be obtained by the common practice of commencing and finishing the color in the same dye. The color is obtained in the first case, in a dye of only half the strength that is required in the second. A general opinion that the copperas used in the black dye, has a tendency to brittle the goods, would be an argument in favor of the plan recommended above; the color is obtained in a weaker dye. With this view of the subject, in coloring yarn or flannel, it would be well to rinse the goods in clean water, before they are dipped in the second dye.

If the care alluded to above, to guard against injuring the goods in this dye, should be unnecessary for some purposes, for which black may be wanted. Omit changing or throwing out the first dye, and with this simple change, proceed to make the colour as directed in the receipts. There are many articles, not mentioned in the preceding receipts, that answer a good purpose in the black dye, but when the cost is counted, good reasons will appear in favour of the present plan. Sumac is an excellent dye drug in colouring black, but if not cut in season, of the proper growth and cured with care, it is worthless; Nutgalls are also amongst the best ingredients in the black-dye, but are too costly for general use. In the receipts, white-oak bark is designed to supply their place, and will be found to answer the purpose very well.

### **No. 5. Dark Snuff Brown, with Walnut Bark.**

Five pounds Wool; dye the wool a good walnut brown but not dark; then boil for one hour; in clean water, one and a half pounds black-oak bark ground as for tanning, and one pound good Camwood, take out the Camwood and Bark, dip the wool and mix it well in the dye, and boil slowly one hour, take up the wool, air and cool it; dissolve two ounces blue vitriol and half a pound copperas, and add to the dye; mix well and dip the wool, taking care to mix it well in the dye that the colour may be evenly, boil

slowly half an hour, and let the wool remain over night in the dye, next day take it out, wash and dry it.

This is an excellent colour, quite on the dark order, improves in fulling, and when dyed in the wool is permanent as Indigo blue. Hence there are several considerations in favour of its general use on cloth, more especially, as it is quite fashionable for over-coats, and other garments, made of broadcloths of excellent quality.

### **No. 6. Dark Snuff Brown, with Black-Oak Bark.**

Five pounds of Wool; boil for one hour, in clean water four pounds of Black-Oak bark ground as for tanning, and one and a half pounds Camwood; take up the Camwood and bark; dissolve one ounce blue-vitriol and add to the dye, then dip the wool and boil slowly one hour, moving the wool frequently in the dye; then take up the wool air and cool it; dissolve four ounces coperas and add to the dye, dip the wool again and boil moderately half an hour, let the wool remain in the dye over night, then rinse and dry it.

### **No. 7. Dark Snuff Brown, with Fustic.**

Five pounds of wool; boil two pounds of Fustic and one and a half pounds of Camwood, dissolve an ounce of blue Vitriol, and add to the dye; dip the wool and boil slowly for one hour, mixing the wool carefully so that the color may be even, then take up, air and cool the wool; add half a bushel white walnut bark, cut fine, to the dye, and dissolve six ounces of copperas and two ounces of alum, and add to the dye; mix well and dip the wool, boil slowly for half an hour, and let the wool remain over night in the dye.

This is a fine color and not subject to fade; the walnut bark may be omitted, but the color will not be so fast, and the wool will not feel as soft.

The Butternut stands unrivalled, amongst our coloring materials, for imparting a fast color, and a soft, tough feel, to those articles on which it is used in dying.

### **No. 8. Bright Snuff Brown, with Black-Oak Bark.**

Five pounds of Wool; boil for one hour, six pounds of black oak bark, ground as for tanning, with one pound of camwood; take up the camwood and bark, and dissolve one ounce of alum, and one ounce and a half of blue Vitriol, and add to the dye; mix the dye well, and dip the wool, boil slowly for one hour, mixing the wool in the dye that the color may be evenly; then take up the wool air and cool it; fill up the kettle and dissolve four ounces of copperas with half an ounce of blue Vitriol, and add to the

dye; mix well, and dip the wool; boil slowly half an hour, and let it remain over night in the dye; next day take up the wool and rinse and dry it.

### No. 9. Bright Snuff Brown, with Fustic.

Five pounds of wool; boil for one hour and a half, two and a half pounds of Fustic with one pound of Madder take out the Madder and Fustic, and dissolve four ounces of alum and add to the dye; stir well, and dip the wool; boil slowly one hour, mixing the wool carefully with the dye, then take up the wool, air, and cool it. Dissolve three ounces blue Vitriol and six ounces of copperas, and add to the dye; mix the dye well and dip the wool, boil slowly half an hour, and let the wool remain in the dye until the next day, then rinse and dry it. Receipts Nos. 8 & 9, are designed for bright snuff colors, in which the yellow has the ascendancy; and are better suited for dying yarn or cloth, than for dying wool. This class of colors admit of a great variety of shade, from the dark London smoke, approaching nearly to black, down to the bright cinnamon, or color of a dried leaf. For instance, in the last receipt, omit the alum in the first dip, and omit two ounces blue Vitriol, and add two ounces to the copperas in the last dip, and instead of a bright snuff color, you will have a very indifferent olive brown whilst all the change that is needed in the same receipt to make a dark and permanent snuff brown, with the shade on the red order, is to omit the pound of Madder and supply its place with a pound and a half of Camwood.

### No. 10. Dark London Smoke, with Black-Oak Bark.

Five pounds of Wool; boil for one hour, eight pounds Black-Oak bark, ground as for tanning and two pounds Camwood then take up the Camwood and bark and dissolve three ounces of Alum and add to the dye, dip the the wool and boil slowly one hour; then take up the wool, cool and air it; fill up the kettle, and add to the dye half a bushel white walnut bark, cut fine, and one pound Logwood, boil it an hour and a half, then take them out and dissolve three-fourths of a pound of copperas, and three ounces blue vitriol, add to the dye with half a gallon chamberlye, mix the dye well and dip the wool, mixing it well in the dye, that the colour may be even, and boil slowly half an hour, let the wool remain in the dye until the next day, then rinse and dry it.

This is a full deep colour approaching nearly to black, but retaining a fine lustre of red and yellow, and permanent as indigo blue.

### No. 11: Olive Brown, with Black-Oak, & White-Walnut bark; Five pounds of Wool.

Boil for two hours, half a bushel of White-Walnut bark, cut fine, then take it out and add to the dye three pounds ground black-oak bark, boil one



hour, take up the bark and dip the wool, boil slowly one hour, mixing the wool that the colour may be evenly, take up the wool, air and cool it, dissolve four ounces copperas and add to the dye, with half a gallon chamberlye, then dip the wool and boil slowly half an hour, mix the wool well with the dye and leave it in the dye over night, next day take it up, rinse and dry it.

No. 12. This colour, though not very deep, has several considerations in its favour, that of being very cheap and durable. On wool, afterwards manufactured into cloth, or linsey, it stands fulling very well and comes out a dark drab, inclining to brown.

No. 13. The seven receipts, last given, are supposed to afford sufficient variety in this class of colours for all practical purposes, and also a general knowledge of the principles that govern dyes of this kind. Any variety of shade may be obtained, by a small change in the process described in the receipts; for example, receipt, No. 6, will make a bright snuff brown with a fine lustre of yellow and red, by omitting half a pound Camwood and using three ounces Alum, in place of the Vitriol, in the first dip, and using two ounces blue Vitriol, and three ounces copperas with half a gallon chamberlye, in the last dip. The red and yellow, in these colours, depend on the Alum for their brightness; the blue Vitriol possesses, to some extent, the properties of both Alum and Copperas, which affords sufficient reason for its use in colours of this kind. Amongst all the fancy colours in use, there are none that possess so many good qualities, and so few bad ones, as those composed of red, yellow, and brown. They are made with little expence, rather improve in fulling and washing, and leave the wool soft and tough, and when manufactured into cloth, is susceptible of the very best finish, and is not subject to fade in wearing.

### No. 14. Walnut Brown.

This colour is commonly made in a cold dye, and best done in the summer, when the sun shines warmly; take a wooden vessel, water tight, and large enough to hold the bark and wool, put a layer of bark in the bottom and a layer of wool on the bark, and so proceed with bark and wool layer alternately, until the lot you wish to dye is packed; then add warm water or, what is better, boil a sufficient quantity of white-walnut bark to make a very strong dye, add this to the wool and bark, until the vessel is full; to have a good even colour the wool must be spread out a few hours every day in the sun, then returned again, as at first, to the dye.

This is a good colour and very fast, but sometimes, either for want of fair weather, (for the sun has a great effect on this colour to deepen and brighten it,) or owing to too weak a dye or both, the process is lengthened out until the wool becomes harsh and brittle, and very much injured. This might be avoided, and the colour obtained with less labour and in much less time.

No. 15. In the fall of the year, when the walnut falls take, a barrel or any vessel of suitable size, watertight, and fill it with walnut hulls, or



if this be too much trouble, throw them in nuts and all; add a little water, just enough to keep them moist, and as they rot and sink down, add more walnuts, until you have laid up as much as will be needed, for all your walnut dyes next summer. Their rotting and having a bad smell, or being wormy, does them no injury as a colouring drug.

No. 16. Next summer, if there be cloth, flannel, or yarn to dye Walnut Brown, fill your kettle and add the amount of walnut hulls you suppose necessary, and bring the dye to boiling heat, then dip and run the goods about forty minutes, take them up and cool them, add more hulls to the dye, if necessary, and continue the process of dipping and running the goods, airing and cooling, and adding the hulls to the dye, until the colour suits your fancy—in this way, a dark walnut brown can be made in half a day. But this plan will not suit for wool, the walnut hulls would stick in, and be a great injury.

No. 17. Shift as much of the Walnut Hulls, as you suppose will be needed in dyeing the wool, into the ash-hopper having sufficient straw in the bottom, to strain the dye well, then add boiling water to the hulls, and as the dye runs off below, shift it into the dye-kettle, until the dye is run out of the hulls; then heat up the dye and dip the wool, mixing it well to make the colour uniform, and after being in the dye an hour or two, at boiling heat, take it out, air and cool it, then dip the wool again boil slowly half an hour, and leave it in the dye over night; next day, if the wool be not dark enough, put up some more walnut hulls, (managing as in the first case,) add the liquor run off the hulls to the dye in the kettle, and proceed with the wool as before, letting it remain in the dye over night, if necessary. In this way you cannot fail to have a fine colour. At receipt No. 5, will be found directions for changing this colour to a dark snuff brown, but it must be remembered that, for this purpose, the walnut brown must be light.

## No. 18. Dark Drab, with Black-Oak & White-Oak Bark.

Five pounds of Wool; boil for two hours, two and a half pounds ground black-oak bark, and one eighth of a bushel white-oak bark, cut fine, then take up the bark, dip the wool, boil slowly one hour, mix the wool carefully with the dye, that the colour may be even, then take up the wool, air and cool it, dissolve four ounces copperas, with two ounces blue vitriol, add to the dye; then dip the wool and mix it well with the dye, boil slowly half an hour, let it remain in the dye over night, then take it out, rinse and dry.

## No. 19. Dark Slate-Drab, with White-Oak Bark.

Five pounds of Wool; boil for two hours, half a bushel white-oak bark, cut fine, and half a pound Camwood, take them up, and dissolve two ounces blue vitriol and add to the dye, stir well, dip the wool, boil slowly one hour,

then take up the wool, air and cool it, add half a pound Logwood to the dye, boil it one hour, then take out the Logwood and dissolve six ounces copperas, add to the dye, dip the wool, boil slowly half an hour, and let the wool remain in the dye until the next day.

### **No. 20. Dark Drab, with Madder; Five pounds of Wool.**

Boil for one hour, half a pound Fustic and twelve ounces Madder then take out the Madder and Fustic, dissolve two ounces blue vitriol, and one of alum, add to the dye mixing it well at the same time, then dip the wool, boil slowly one hour mixing the wool well with the dye, then take up the wool, air and cool it, dissolve six ounces copperas. add to the dye, then dip the wool and boil slowly half an hour, letting it remain over night in the dye, take up, rinse and dry.

### **No. 21. Dark Drab, with Black and White Oak BARK.**

Five pounds of Wool; boil for two hours, one pound black-oak bark ground, and three gallons white-walnut bark, cut fine, then take them out, dissolve three ounces blue vitriol and one ounce of alum, add to the dye, mix well and dip the wool boil slowly one hour, mixing the wool with the dye that it may colour uniform, then take the wool up and air it; dissolve six ounces copperas, add to the dye with half a gallon chamberlye, then dip the wool, boil slowly half an hour, and let it remain until next day, in the dye, then rinse and dry it.

### **No. 22. DARK DRAB, WITH FUSTIC & LOGWOOD.**

Five pounds of Wool; Boil for two hours, three-fourths of a pound Fustic and three-fourths of a pound of Logwood; then take them out of the dye, dissolve three ounces blue vitriol, and add to the dye, dip the wool, boil slowly one hour, then take it up, cool and air; dissolve six ounces copperas and add to the dye; then dip the wool and boil slowly half an hour, mix it well with the dye, and let it remain over night.

This is a fine dark colour, and improves in fulling and washing; but the Logwood part of the dye will fade in wearing.

### **No. 23. Light Drab, with Nut-Galls; Five lbs. Wool.**

Boil for one and a half hours, six and a half ounces nut-gall, two and a half ounces madder, two ounces logwood and one and a half ounces fustic, with three ounces cream tartar; then take out the dye drugs & dip the wool; boil slowly one hour, then take up the wool, air and cool, dissolve two ounces copperas, add to the dye, then dip the wool, mix it well with the dye that the colour may be even, let it remain over night in the dye, rinse and dry it.

No. 24. A fine drab, partaking in a considerable degree the rich appearance of the bright snuff brown, may be obtained by following the above receipt, only omitting the copperas in the last dip.

### No. 25. Light Drab, with Fustic; Five pounds Wool.

Boil for two hours, half a pound good Fustic finely cut, and four ounces Logwood; then take it out, dissolve one ounce blue vitriol, add to the dye, mixing it well at the same time, dip the wool and boil slowly one hour, take up the wool, air and cool it, dissolve three ounces copperas, and add to the dye, with half a gallon chamberlye, dip the wool and boil slowly, half an hour, mix well and let it remain in the dye over night.

### No. 26. Light Drab, with Madder; Five pounds Wool.

Boil for one hour; half a pound good Madder and four ounces Fustic, with two ounces cream tartar, then take out the dye drugs, dip the wool, mixing it well with the dye, boil slowly one hour, then take up the wool, air and cool it; dissolve one ounce blue vitriol and two ounces copperas, add to the dye with half a gallon chamberlye, dip the wool, mix it well with the dye that the colour may be even, boil slowly half an hour. let the wool remain over night in the dye, rinse and dry it.

### No. 27. Light Drab, with Black-Oak, and White-Walnut Bark.

Five pounds wool: Boil, for one hour a pound black-oak bark, ground, with one peck white-walnut bark cut fine; then take up the barks, dissolve one ounce blue vitriol and add to the dye, dip the wool, boil slowly one hour, then take it up, air and cool it, dissolve four ounces copperas and add to the dye, with half a gallon chamberlye, then dip the wool, mixing it well with the dye that the colour may be even, boil slowly half an hour, and let it remain overnight, next day take it out, rinse and dry it.

### No. 28. General Remarks on Drab Colours.

Supposing that receipts, for all useful purposes, have been given in the way of drab colours. It may be remarked that, almost any kind of drab may be obtained in a variety of ways; although this is the case, it is important to those who are interested, to be acquainted with the means by which these colours are produced, in their most perfect and durable state. With this view, it may be remarked that, those dye drugs which afford permanent colors, and that approach nearest to the shade, we wish to obtain, may be safely used. Hence, brown drabs are the most durable of all others, for the simple reason that, we have materials in abundance, that with

very little change, afford this color. Such, for instance, as Madder and Nut-Galls; Madder and White-Oak bark, Walnut Hulls, &c.

No. 29. For drabs on the yellow or olive-green shades, fustic, black-oak and hickory barks, any thing, in short, that affords a fast yellow, will answer the purpose; but unless these be used in connection with other dye drugs, with which copperas can act more efficiently, than on the yellow dye, colors will be produced, in which the copperas is in such a feeble and superficial state that, even weak acids and alkalies will neutralize it entirely, and the yellow, in such colors, will resume its natural shade. Hence, the reason, why this class of colors, on domestic cloths, stain so easily, and fade in washing and wearing.

No. 30. To obviate this evil, recourse is had to nut-galls, sumach, white oak bark, and pin-oak barks, maple bark—any thing that can be introduced, with the yellow above spoken of, with which copperas will combine, in such a way, as to resist the tendency, in this color, to stain and fade.

No. 31. If, in addition to the above precautions, the color be made in the wool, in place of being dyed on the web after the fulling is finished, the difficulty will be entirely removed; then the color being deposited in the pores of the wool, instead of the pores of the cloth, it cannot fail to be equally distributed through the body of the cloth; and the soap, in the process of fulling, will produce all the change that is likely to take place in the color, whilst the cleansing the cloth of grease, by washing, carries off any dye, that may have remained superficially attached to the goods.

No. 32. In leaving this subject, the Author will avail himself of the opportunity to say, that the receipts and plan recommended in drab colors, cannot be otherwise, than highly satisfactory and useful to the public, if brought into general use. The dyes are very cheap—cost almost nothing, but a little time and labor, whilst many of them are very handsome, and if made as directed, are permanent as any other colors—will stand washing, when soiled by use, without fading, and from the softness imparted to the wool, by fulling after being colored, cannot fail to have preference, in point of utility, over the common practice. In short, he feels safe in saying, that cloth can be made in this way at less cost, and twenty five per cent. better, than can be made of the same quality of wool manufactured in the common way, and dyed in the web after being fullled.

No. 33. A better saddening than copperas may be obtained, by procuring a peck or more, (according to the quantity of goods intended to be dyed,) of iron scales at a blacksmith's anvil block, mix them up in a vessel with chamber-lye, the evening before they are to be used; next day turn them into a box made into the form of an ash-hopper, and apply hot water until the strength is run off.

No. 34. This is a much better saddening liquor, in many cases, than copperas, especially in Browns, blacks, and drab colors.

No. 35. The only difficulty attending its use is, that the inexperienced dyer has no rule, by which to apply the proper quantity. This is



obviated by applying the liquor at several times, say one half at first; after the wool has been slowly boiled an hour, take some of it out, and wring out the dye; if the color appears, as though it would not be dark enough, take up the wool and add the remainder of the saddening, or as much as the case may require

No. 36. In this way, you avoid the harshness that copperas sometimes imparts to wool, and cannot fail to obtain better colors, and better goods than can be obtained by the common use of copperas.

No. 37. For some browns, intended to have a fine lustre of red, and others a lustre of red and yellow. An excellent saddening can be prepared from scales off iron, by putting up some wheat bran with scalding water in a vessel, and letting it remain until it becomes very sour, then straining it off, and using it on the iron scales according to the above directions.

This plan is attended with some labor, it is true, but it should be recollected that, the work is your own, and that abundant compensation will be realized, from the superior color and quality of your cloth.

### No. 38. London Brown, on Cloth or Yarn; Five pounds.

Boil in fair water two pounds good Camwood fifteen minutes, then dip and run the goods with a reel one hour, then take out the goods, air and cool them; fill up the vessel and raise the heat, then dip the goods and run, the dye boiling half an hour, take them out, air and cool them, dissolve two ounces blue vitriol and add to the dye, dip and run the goods, as before, half an hour, then take them up, air and cool them; dissolve four ounces copperas, add to the dye, then dip and run the goods until the colour pleases.

No. 39. If the copperas in the above dye be dissolved in good vinegar, the colour will be more lively and better; for this purpose set a tin-cup with half a pint of vinegar on some coals, to which add five ounces copperas, and stir constantly, until the copperas is dissolved.

### No. 40. London Brown, on Cloth or Yarn; Five pounds.

Boil two pounds good Camwood in fair water fifteen minutes, then dip the goods and run them in the dye three-fourths of an hour, take them up, air and cool them, add half a pound Fustic and one peck Walnut-Hulls to the dye, fill up the kettle and boil one hour, then dip and run the goods half an hour, take them up, air and cool; dissolve two ounces blue Vitriol and one ounce Alum, add to the dye, then dip and run the goods half an hour, take them up air and cool; dissolve six ounces copperas in vinegar, as described in receipt thirty-nine, and add to the dye, then dip the goods and run until the colour pleases.



### No. 41. London Brown, on Cloth or Yarn; Five pounds.

Boil two pounds Camwood in fair water fifteen minutes, then dip the goods, and run them in the dye half an hour; take them up, air and cool them, add to the dye, threefourths of a pound black oak bark, ground as for tanning, and one peck white-walnut bark, cut fine; fill up the kettle and boil the bark one hour, then dip the goods and run them half an hour, dissolve two ounces blue vitriol and one ounce of alum, add to the dye, then dip the goods, and run them in the dye half an hour, take them up, air and cool them; dissolve in vinegar six ounces copperas and add to the dye, then dip the goods and run until the colour suits.

### No. 42. DARK LONDON BROWN; 5 Pounds.

Boil two pounds Camwood in fair water fifteen minutes, then dip the goods, and run them in the dye, thirty minutes; take them up, air and cool them; add half a pound of Fustic and half a peck of walnut hulls to the dye, and boil one hour, take them up and air and cool them, then add half a pound of logwood to the dye, fill up the kettle and boil half an hour, then dip and run the goods half an hour, take them up, and add two ounces of blue Vitriol, and five ounces of copperas dissolved, to the dye, and dip and run the goods until the color suits.

### No. 43. Red, with Camwood.

Five pounds of yarn; boil two pounds of good Camwood in fair water for half an hour, then dip and run the goods for three-quarters of an hour, take them out, air and cool them; fill up the kettle and dip the goods, and run them half an hour, take them out, air and cool them; dissolve two ounces of blue Vitriol, and two ounces of alum and add to the dye; then dip the goods and run them in the dye, until the color suits.

### No. 44. Red, with Camwood and Fustic.

Five pounds of yarn; boil two pounds of Camwood and half a pound of Fustic in fair water, for half an hour, dip and run the goods for thirty minutes, then take them out, air and cool them; fill up the kettle, and dip and run them, as before, for half an hour; then take out the goods and cool them; dissolve two ounces of blue Vitriol and one ounce of alum, and add to the dye; then dip and run the goods, until the color suits.

No. 45. Both the above colors are a little on the brown order, and although they wear a length of time, without fading much, they change still more to the brown, and more particularly so, if washed. Being very cheap, they are frequently used in carpeting. The Fustic, in the last receipt, gives the color an orange tinge, which may be increased by adding Fus-

tic to suit the fancy of the dyer; the fustic, in this dye, has also the tendency to render the color more fast.

### No. 46. PINK COLOUR; FIVE POUNDS.

Fill your kettle with fair water, and, when at boiling heat, add twelve ounces alum and six ounces cream tartar, boil fifteen minutes, mix the dye well, take off what scum may rise, dip the goods and run them, the dye boiling one hour; take them up, air and cool them; empty the dye from your kettle and fill with fair water, and add twelve ounces good madder; rinse the goods in clear water, and when the dye is near boiling, having been frequently stirred, dip the goods and run them one hour.

### No. 47. VIOLET COLOR; FIVE POUNDS.

Boil for one hour, one and a fourth pounds of good Brazil wood with seven ounces of logwood in fair water; dissolve four ounces of alum, and add to the dye; then dip and run the goods half an hour; then take them up, air and cool them; then fill up the kettle and raise the heat of the dye, and dip and run the goods as before, half an hour, then take them up and cool, then add half a gallon chamberlye, and dip and run the goods until the color pleases.

A number of shades, of this color, may be made in this kind of dye, by varying the Logwood and Brazil, to suit the fancy of the dyer. This color is very fine, and although not permanent, may answer in articles not exposed to the sun and weather.

### No. 48. RED WITH MADDER; FIVE POUNDS YARN.

Fill your kettle with fair water, and add three quarts of wheat bran, mix it well, raise the heat, when scalding hot the bran will rise to the top, take it off with a skimmer and add one pound alum and four ounces cream tartar, bring the dye to boil, dip and run the goods one and a half hour, boiling moderately all the time, then take up the goods and rinse them carefully, in clear water, fill the kettle with fair water and add three quarts wheat bran, raise the heat moderately, mixing the bran well through the water, and when the water becomes hot enough to raise the bran, skim it off, then lower the heat by throwing a few pails of cold water in the kettle, and add two pounds good Madder, and manage the fire so, that the madder may be half an hour at least in the dye without boiling, during this time, it ought to be frequently well stirred with the dye, then dip the goods and run them carefully one hour; being particular not to let the dye boil, then take up the goods, air and cool, fill up the kettle, raise the heat and when the dye comes near to a boil, dip and run the goods, as before, three-quarters of an hour, let the dye boil, say three minutes, and take up the goods.

## No. 49. GENERAL REMARKS ON MADDER RED.

There are different ways of setting this color or brightning, as it is frequently called. Some dyers would add half a gallon chamberlye to the dye, and run the goods to finish; others would empty the kettle and start a new dye, in which they would boil half a pound Brazil wood, and run the goods for a finish—others, again, lay aside the Alum liquor, in which the goods were first dipped, and set the color in that. The best, however, with which the author is acquainted, would be to mix chamberlye and water, equal parts of each, sufficient to immerse the goods in, and when heated to almost scalding, handle the goods carefully through, for about fifteen minutes and hang them up to sun and air—another very good way is, to make a strong soap-suds, have it middling warm, in which handle the goods carefully, as in the former case.

No. 50. There are many places, that do not afford water sufficiently pure, for coloring good madder red, the bran is used in the madder dye to cleanse the water.

Madder contains several colours, one of which is brown, and is injurious in dying red; but water does not extract the brown color, readily, unless it is made to boil; for this reason, madder red is dyed with as little boiling as possible; for the same reason, something may be gained by wetting up the madder, with warm water, in a clean bucket or crock, the day before it is used; the red color will be extracted easier, than if added in a dry state to the dye.

No. 51. A beautiful snuff brown may be made in the madder dye, after the red is finished, by adding one and a fourth pounds Fustic, or as much black-oak bark ground; boil well one hour, then let it remain over night; next day dip off the dye until it is got clear of the grounds; then return the dye to the kettle; heat the dye, and add two ounces blue Vitriol and four ounces copperas, then dip six or eight pounds of wool that has been dyed a good walnut brown; boil slowly half an hour, and mix the wool well with the dye, that the color may be even, and let it remain over night in the dye.

## No. 52. YELLOW WITH FUSTIC; FIVE POUNDS YARN.

Boil one and a half pounds Fustic, one hour, in fair water; then add half a pound alum to the dye, mix well, dip the goods and run them carefully half an hour, take them up, air and cool them; fill up the kettle and raise the heat; dip and run the goods as before, boiling for half an hour, then take up the goods and air them; if the yellow be not deep and bright enough, add more alum, and run the goods until the color suits.

## No. 53. YELLOW, WITH BLACK-OAK BARK.

Five pounds yarn; boil for half an hour; two pounds black-oak bark, ground as for tanners, in fair water, dissolve twelve ounces alum and add

to the dye; mix well, dip and run the goods carefully half an hour; then take up the yarn and cool it; fill up the kettle and raise the heat; dip and run the goods as before, and if the color be not full and bright enough, add more alum and run, till the color pleases.

No. 54. These receipts will answer for yellow with hickory bark, or hickory and black-oak, or peach leaves or apple bark; all that is necessary, is to adopt whatever bark is preferred, in place of that described in the receipt. Nature has supplied us so liberally with materials for the yellow dye, that we are sometimes at a loss to make choice from among them.

No. 55. They are all, however, dependent on alum or acid of some kind, for their beauty, and just in proportion to the strength of the acid used in the dye, so will be the fineness and clearness of the yellow.

No. 56. Among all the articles that afford this color, there is none, perhaps cheaper, or better adapted to general use, than the black-oak bark, as it imparts, when properly applied, every variety of shade, with all the richness of which the yellow dye is susceptible.

No. 56. Tons, of this valuable article, are exported annually to foreign countries for coloring purposes, while we import large quantities of yellow dyes, to supply the place of a better article growing on our own farms.

No. 57. The same thing may be said with regard to the brown dye; there is no coloring matter whatever, that can make a more permanent color, than walnut barks and walnut hulls. Were the bark of the butt-nut taken off at the right time, and treated as black-oak is for tanning, and carefully put up for coloring purposes, with the aid of madder and black-oak, the very best of browns could be dyed, either on wool, flannel or cloth, as well as a number of other colors, equally valuable and worthy our attention.

No. 58. Madder also is equally worthy of our notice. If this article be not cultivated for export, it ought at least to be cultivated by almost every family, to such an extent, as would supply their own wants. A great part of the fertile lands, in the Ohio valley would produce Madder of good quality, with about as little labour as is needed in the cultivation of the Artichoke. In a soil sufficiently open and rich the Madder plant will extend its roots the third year, after settling to the depth of three feet, and literally fill the soil, on which it grows, with a net work of roots—whilst all the cost incurred in the production of this valuable dye drug is to give it room in some corner of your garden or lot, and prevent the weeds from overrunning it the first year.

The third year after planting, Madder comes to maturity, but will continue to grow as luxuriantly as ever. Those who cultivate it for their own use, select after the third year, the fine roots only, for coloring bright reds, and throw aside the coarser roots for brown dyes. These roots are used for coloring red, with no other preparation than that of washing, when taken up, and being bruised before they are used in the dye-kettle.

To farmers and others, it may be an inquiry of some interest, whether the production, on our own farms, of this valuable dye-drug, which would

be rather an agreeable amusement for our children, in a leisure hour than a laborious task, might not be more advantageous, than exchanging butter, at from four to six cents per pound, for the foreign article.

### *No. 59. PRUSIAN BLUE OR CYMIC.*

Take half a pound good Flotong Indigo and grind it fine, this may be done on a stove plate with an old smoothing-iron for a rubber, pass the Indigo through a sieve made for that purpose, the Indigo that remains in the sieve must be ground again, and when all is reduced to a very fine powder, put two and a half pounds best quality of oil of Vitriol; in a stone crock, jug, or pitcher, that will hold six or eight quarts, add the Indigo and mix it effectually with the Vitriol, then add one ounce fine Salt, mix the whole well together by constant stirring for an hour, or until it gets settled down and cool, for it will heat and foment very much at first.

### *No. 60. GENERAL REMARKS.*

The oil of Vitriol, is used in the above preparation, to dissolve the Indigo, which cannot be done unless made very fine; hence, we use a sieve and grind over what does not pass through it.

No. 61. The sieve may be made by stretching a bit of open muslin over a hoop of proper size.

No. 62. There are several kinds oil of Vitriol, some are not pure, and others are too weak for this use. The best quality is the only kind that will dissolve the Indigo, or answer any good purpose in this composition.

No. 63. A vessel, that holds seven or eight times the quantity of the compound, must be used for mixing it in. When the Indigo and Salt are added to the oil of Vitriol, it fuments and heats very much, and increases in bulk, to such a degree that it would run over if not prevented by the above precaution; The vessel must be clean, for oil or fat of any kind would spoil the preparation. When the mixture is finished, keep it close, stirring it occasionally, for four or five days, and it is fit for use.

### *No. 46. ANOTHER METHOD FOR BLUEING, OR CYMIC.*

Take half a pound good common Indigo, and three pounds oil of Vitriol, with one fourth of a pound stone Lime; put these together as described before; this will be fit for use in forty-eight hours.

If Flotong Indigo, which is the best for this use, cannot be had, select the softest and best you can get, soft Indigo is the easiest ground or made fine, and dissolves better in the oil of Vitriol, than hard.

No. 65. This composition is commonly used for dyeing greens. One ounce of good indigo, well prepared in this way, will color three pounds of yarn a good green.



*No. 66. PRUSSIAN BLUE.*

Fill your kettle with fair water, heat it nearly boiling hot, then add of your Cy닉 or blueing a little, stir it well with the water, then dip the goods and run them carefully fifteen minutes, take up the goods, air and cool them, then add more of the blueing, dip and run the goods as before; continue adding the blueing in small quantities, dipping and running the goods, until the color suits, being careful each time that blueing is added, to mix it well with the dye, and change the end of the goods each time you dip, so that the end that went into the dye last the first dip, may go in first the second dip, this is done in order to make the color even.

If the blueing be mixed in a bucket of cold water, and added to the dye, it will be better and safer; sometimes, if the blueing be poured into boiling dye, it splashes about and the dyer is in danger of being scalded.

The Prussian or Saxon blue, though a bright color, does not possess the good qualities of the common indigo blue, being a lively bright color; it is consequently, used in articles, not exposed to the weather or frequently washed.

*No. 67. GREEN; FIVE POUNDS YARN.*

Boil, in fair water, two pounds of Fustic one hour; then add one ounce alum, dip and run the yarn half an hour, the dye being boiling; take up the goods and add about one fourth of your blueing or Chymic, mix it well with the dye; then dip and run the goods fifteen minutes, having the dye boiling; then take up the goods and air and cool them; add one fourth more of the blueing, and dip and run the goods as before; continue to add blueing little by little, and to dip and run the goods till the color pleases.

This is among the very best methods for dyeing a bright Saxon green, and although, there is considerable of care and judgment required in the process, follow the receipt, and you cannot fail to have a fine color.

*No. 68. GREEN; FIVE POUNDS YARN.*

Boil two pounds Fustic one hour; then add half an ounce of alum, and dip and run the goods till they are a good yellow; then add the blueing, a little at a time, and dip and run the goods, as in the former receipt, until the color is well raised; then add a little copperas and logwood to darken the color, and run the goods till the color pleases.

*No. 69. Green.*

For five pounds yarn: boil, in fair water, two pounds Fustic, one hour; then dissolve half an ounce alum, and add to the dye, with one half of the blueing. Mix it well with the dye, dip and run the yarn thirty minutes, take up the yarn, air and cool; then add the rest of the blueing, and run the

yarn in the dye again half an hour, the dye boiling; take up the yarn and dissolve half an ounce blue vitriol, and add to the dye; then dip and run the goods, till the color pleases.

### No. 70. Bottle Green.

For five pounds yarn: boil one and a half pounds Fustic one hour, dissolve half an ounce alum, and add to the dye; mix the dye well, and dip and run the goods half an hour; take up the goods and air them, then dip and run the goods as before, having the dye to boil; take up the goods, add half the blueing, and run the goods in the dye half an hour; take them up and add the rest of the blueing, mix it well with the dye, run the goods as before, having the dye to boil; take up the goods and air them; fill up the kettle, add half a pound logwood to the dye, and boil it forty minutes. Grind half an ounce verdigris fine, dissolve it in half a pint of vinegar, and add to the dye; stir the dye well, dip and run the goods forty minutes, the dye boiling; then take up the goods and air them, dissolve six ounces of copperas in half a pint of vinegar, add one half to the dye, and run the goods half an hour; then take them up, air and cool them; if not dark enough, add the rest of the copperas, and run the goods till the color pleases.

This is the best way of making a bottle green, with Saxon blue or Chymic, that the author is acquainted with; but he cannot recommend it as a fast color. All has been done, by the best dyers in Europe and America, that art and experience could suggest, to make the Saxon blues and greens permanent, but thus far, it has been a failure.

No. 71. To dissolve Verdigris in Vinegar. Make it fine, as described in the preceding receipt, and mix it with the Vinegar in a tin cup; set it on some coals, and stir it continually fifteen minutes; dissolving copperas in Vinegar has already been described.

### No. 72. Bottle Green.

For five pounds Yarn: Fill your kettle with fair water, bring it to boil, dissolve three ounces blue vitriol and add to the dye; dip and run the goods half an hour; take them up, air and cool them; add one pound fustic, and three fourths of a pound Logwood to the dye, and boil well one hour; then dip and run the goods, till the color pleases, and you will have a fine bottle green.

### No. 73. Grass Green.

Five pounds wool: Boil two and a half pounds Fustic one hour, dissolve twelve ounces Alum and three ounces Cream of Tartar, and add to the dye; mix the dye well, and dip and run the goods one hour; take them up, air and cool them: then add one third of the blueing, mix it well with the dye, dip and run the goods half an hour; then take them up, and air them;

fill up the kettle, add more of the blueing, and continue to run the goods; add of the bluing until the color pleases.

All this class of colors are objectionable; for they fade in washing and wearing.

No. 74. The beauty of the colors, the velvet like softness, imparted to the goods by the dye, as well as the hope of shortening the process of blue dying,—have been inducements, sufficiently strong, to enlist in its favor the most untiring industry and perseverance; but thus far (and it is much to be regretted,) the best efforts, of the most experienced Chymists and dyers, have failed in making fast colors, however beautiful they may at first appear, with any preparation of Indigo, where oil of Vitriol was used as a solvent.

No. 75. In making the above remarks, the author does not wish to be understood, as representing the above class of colors, as altogether worthless; nor is it his wish, to lead any one astray, from their own interest; and although, these colors will not stand washing nor exposure to the sun and weather.—yet there are a variety of useful purposes, to which they can be safely appropriated.

### **Bottle Green.**

Five pounds goods: Dissolve in fair water, two ounces blue vitriol, and three ounces cream of tartar; bring the mixture to boil, dip and run the goods one hour; take them up, air and cool them; then add two pounds good logwood, and one pound fustic; boil them one hour; then dip and run the goods one hour; take them up and cool them, and add one gill blueing and one ounce verdigris, dissolved as described at receipt, (No. 70.) to the dye: mix it well, dip and run the goods half an hour; take them up, air and cool them; dissolve six ounces of copperas in vinegar (as described at receipt No. 20.) and add to the dye; then dip and run the goods till the color pleases.

### **No. 76. Blue with Logwood.**

Five pounds: Boil two pounds Logwood one hour in fair water, then add six ounces Madder, and six ounces Alum. Boil slowly fifteen minutes, dip the goods and run them in the dye, half an hour; take them up and air them. Fill up the kettle, and raise the heat; dip and run the goods as before, half an hour; then take them up and air them—grind half an ounce Verdigris very fine, mix it with one pint of chamberlye in a proper vessel, and simmer them together, constantly stirring till well mixed and dissolved; add it to the dye with one gallon chamberlye, mix the dye well together, dip and run the goods until the color pleases.

### **No. 77. Blue with Logwood.**

Five pounds wool or yarn. Fill the dye kettle with fair water, and bring to boiling heat, take one pound copperas, a quarter of a pound alum, and two ounces crude tartar; pulverize these together, and add to the

boiling water. Skim the dye, and stop its boiling; dip the goods and run them in the dye half an hour; take them up, and air them; then dip and run them in dye, as before, half an hour; take up the goods and empty and clean the kettle, and fill with fair water: add one and a half pounds logwood, and boil half an hour; then add four ounces madder, let the dye simmer fifteen minutes, add half an ounce verdigris prepared as in the last receipt; and add also half a gallon chamber-lye. Mix the whole well together in the dye, dip and run the goods half an hour, then take up and air them: add half an ounce pearlash to the dye dip and run the goods until the color pleases.

### **No. 78. Blue with Logwood.**

Five pounds wool: Fill the kettle with fair water, and bring to boil; dissolve twelve ounces alum, three ounces cream of tartar, and two ounces blue Vitriol, and add to the dye. Mix the dye well, dip the wool, and boil slowly one hour: let it remain three hours in the dye, mixing the wool with the dye, occasionally, that the color may be uniform; then take up the wool, and air it; pile it closely in a heap, and let it remain over night; next day empty the kettle and fill with fair water, to which add two pounds logwood, and boil one hour; then take up the logwood, fill up the kettle, and add four ounces madder; simmer the dye fifteen minutes, and add two ounces blue Vitriol, four ounces copperas, and one gallon chamberlye; mix the dye well, and dip the wool; boil slowly one hour, then take up the wool, air and cool it, return it to the dye, and boil slowly half an hour; let it remain till next day, then rinse and dry it.

These colors leave the wool soft and stand fulling and washing well, but fade in wearing.

### **No. 79. To Granulate Tin.**

Take of the purest blocktin the quantity intended for use, and melt it in a ladle; then pour it very slowly into a bucket of clean water, holding the ladle about two feet above the bucket, then take out the tin and dry it for use.

### **No. 80. Murio Sulphate of Tin.**

Put three pounds Muriatic acid in a large glass bottle or stone-jar, to which add, very slowly, one pound fine grain tin, prepared as above described, and after the tin, add very slowly, two pounds oil of Vitriol. When this mixture has remained in a warm room thirty-six hours, it is fit for use, but will improve by standing several weeks. The good quality of the above composition, will depend, very much, on the care with which the tin and vitriol are added to the muriatic acid. The tin should be added at the slow rate of four ounces per hour, and the oil of Vitriol should also be added very slowly.

## No. 81. Nitrate of Tin.

Mix, in a stone jar, six pounds nitric acid, with six pounds rain water, to which add, very slowly, one pound fine grain tin, and stir well; then add ten ounces Sal ammoniac, and stir well. This solution will be fit for use in twelve hours—the tin should be added with the same care, as in the preceding receipt.

### No. 82. *Bright Sauff Brown, with Murio Sulphate of Tin.*

Five ponds of Wool: boil for one hour in fair water, four and a half pounds Black-oak bark ground as for tanning; then take up the bark, and add to the dye five ounces murio sulphate of Tin, five ounces alum, and two ounces crude tartar. Boil these fifteen minutes, add a bucket of cold water to the dye, mixing it well at the same time; then dip the wool, and boil slowly one hour, mixing the wool carefully with the dye, that the color may be even. Then take up the wool and rinse it—shift the dye from the kettle, and fill with fair water, to which add two and a half pounds ground Camwood and thirteen ounces Logwood, and boil them one hour; then take up the Logwood and Camwood, and dissolve one ounce blue Vitriol, and three ounces Copperas, and add to the dye. Mix them well, and dip the wool; boil slowly half an hour, mixing the wool carefully with the dye, and let remain in the dye over night; next day take it up, and rinse and dry it.

### No. 83. *Bright Sauff Brown, with Murio Sulphate of Tin.*

Five pounds wool: boil six ounces black-oak bark in fair water half an hour, take up the bark, and add to the dye four ounces Murio Sulphate of Tin, four ounces Alum, and two ounces crude tartar. Boil the dye fifteen minutes, mix it well, and dip the wool; mixing it well with the dye, and boil slowly one hour; then take up the wool, air and cool it; fill up the kettle, and dip the wool again; boil slowly, half an hour, and let it remain in the dye over night; next day take it up and rinse it, shift the dye from the kettle, and wash it; fill with fair water, and add two pounds good Madder and twelve ounces Logwood, and dip the wool; boil slowly one hour, then take up the wool, air and cool it; dissolve four ounces copperas, and add to the dye; dip the wool again, mixing it carefully with the dye, boil slowly half an hour, and let it remain in the dye over night.

### No. 84. *French Brown, with Nitrate of Tin.*

Five pounds of wool: fill the dye kettle with fair water and bring it to boil, then add ten ounces Alum, five ounces crude tartar, and two ounces nitrate of tin; boil fifteen minutes, mix the dye well, and dip the wool, carefully mixing it in the dye, and boil slowly three hours; then take up the wool, air and cool it; pile it up closely, and let it remain undisturbed for thirty-six hours. At the end of which time, have a dye prepared by



boiling, in fair water, twelve ounces Logwood, and two and a half pounds Fustic one hour; then lower the heat of the dye, by adding cold water, and add two and a half pounds Madder; let the dye stand without boiling one hour, then take out the dye stuff, and dip the wool; boil slowly one hour, then take up the wool, air and cool it; dissolve four ounces copperas, and two ounces blue vitriol, and mix well with the dye; return the wool to the dye, and boil slowly one hour; let it remain over night in the kettle, next day take it up, and rinse and dry it.

*No. 85. Bottle Green, on Wool.*

Five pounds Wool: dye it a light Indigo blue, and have a dye prepared by boiling, in fair water, one pound Sumac one hour, dissolve six ounces Alum and four ounces Crude tartar, take up the Sumac, and add the Alum and tartar; dip the wool and boil slowly two hours, carefully stirring the wool with the dye, that the color may be uniform; then take up the wool, air and cool it, pile it up in a close heap, and let it remain so for twenty-four hours, at the end of which time, have a dye prepared, by boiling, for two hours, five pounds Fustic and twelve ounces Madder, in fair water; take up the Fustic and Madder, and dip the wool; boil slowly two hours, mixing the wool well with the dye; then take up the wool, and air it; dissolve four ounces copperas, and add to the dye; return the wool to the dye, boil slowly half an hour, and let it remain over night; next day take it up, rinse and dry it.

*No. 86. Bottle Green on Wool, with Murio Sulphate of Tin.*

Five pounds wool: first dip, (a light indigo blue) then have a dye prepared by boiling two hours in fair water, twelve ounces logwood and four pounds black-oak bark; take up the dyestuff, and add to the dye, six ounces murio sulphate of tin, four ounces alum, two ounces crude tartar; boil them fifteen minutes mix the dye well, dip the wool; boil slowly one hour; then take up the wool, and air it; fill up the kettle, and return the wool to the dye; boil half an hour, mixing the wool well in the dye, that the color may be uniform, and let the wool remain in the dye over night, next day rinse and dry it.

*No. 87. Bright Green, for Cloth, Flannel, or Yarn, with Murio Sulphate of Tin.*

Five pounds: first dip, (a light indigo blue) then have a dye prepared, by boiling in fair water, for one hour, three and one fourth pounds black-oak bark, ground as for tanner's use; then take up the bark and dissolve two ounces crude tartar, and add to the dye, with five ounces murio sulphate of tin; mix the dye well, then dip and run the goods, carefully, with the reel, until the color suits.

*No. 88. Dark Green on Cloth, Flannel, or Yarn, with Murio Sul. of Tin.*

Five pounds: The goods must have been dyed in the wool, a light Indigo blue. Fill your dye kettle with fair water, and bring it to boil; then dissolve half a pound Alum, and five ounces crude tartar, and add to the dye; boil five minutes; mix well, then dip and run the goods, with the reel, carefully opening them to air, as they pass over the reel; continue this operation two hours. Then reel up the goods, let them drain a few minutes, and fold them over on the cooling board; air them over, and fold them up closely: let them remain closely packed up, and covered twenty-four hours. Empty the kettle and wash it; fill with fair water, and boil three and a fourth pounds Fustic one hour; then cool the dye, by adding a bucket of cold water, and seven ounces good Madder; let the dye simmer half an hour, dip and run the goods, till the color pleases.

*No. 89. Bright Green for Baize, or Flannel, with Murio Sulphate of Tin, and Sulphate of Indigo.*

Five pounds goods: boil one hour, in fair water, two and a half pounds black-oak bark ground: then take up the bark, and dissolve three and a half ounces alum, one and a half ounces crude tartar, and add to the dye, with four ounces murio sulphate of tin; stop the boiling of the dye, by adding a bucket cold water; then having the dye well mixed, dip and run the goods, reeling them carefully from end to end, and opening, and airing well; in about twenty minutes, bring the dye to boil, and run the goods one hour longer, the dye boiling; then take up the goods, air and cool them; then add Saxon blue or Chymic, a small quantity at a time, and run the goods till the color pleases; arrange it so that the blueing will be added, at three times, running the goods about twenty minutes, each time.

*No. 90. Saxon Green, with Murio Sulphate of Tin.*

Six pounds yarn: Boil in fair water for one hour, two and a half pounds black-oak bark; then take up the bark, and dissolve eight ounces alum and four ounces crude tartar, and add to the dye, with eight ounces murio sulphate of tin; mix the dye well, and dip the goods. Have the dye below the boiling point when the goods are dipped, bring the dye to boil, and run the goods in the dye thirty minutes; then take them up, and add the blueing or Chymic, (as in the last receipt,) and run the goods till the color pleases.

*No. 91. Yellow, with Murio Sulphate of Tin, and Black-Oak Bark.*

Four pounds yarn: Boil in fair water for one hour, one and a half pounds black-oak bark ground as for tanning; then take up the bark and dissolve four ounces alum, and three ounces crude tartar, and add to the

dye, with five ounces murio sulphate of tin. Mix the dye well, dip and run the goods, till the color pleases.

No. 92. Some remarks have been made, on the coloring properties of Black-Oak Bark, to which may be added that, in order to apply it most advantageously, in dying bright yellows, greens and orange colors, it should be carefully selected in the woods, and taken off those trees, that afford bark of the richest yellow color, which is easily ascertained, by cutting through the bark. The best time to take it off is in May. It should be cleared of all the dead part, retaining for use that part only, which is soft and growing. This should be put up, and carefully protected from wet and dirt, until fully dry, and then reduced to fine powder, which is easily done, the inner bark being quite soft.

In this state, by the aid of Murio Sulphate of Tin, Alum, and Tartar, every shade, from the richest and most beautiful orange yellow, down to the clearest and most delicate Lemon tinge, may be produced in their greatest possible degree of perfection.

No. 93. But in order to obtain the colors, above described, every thing must be right, nothing done on the shares, the bark must be of the right kind, and prepared in the proper way; the kettle, and every thing that touches the goods during the process of colouring, must be clean as a new pin, and the goods must be clean as a lady's wedding dress.

#### *No. 94. Deep Orange Yellow, with Black-Oak Bark.*

Five pounds yarn: Fill the copper with fair water, and when it comes to boil, add fourteen ounces black-oak bark prepared as described at No. 92, and boil fifteen minutes; take up the bark and dissolve four ounces alum, and four ounces crude tartar, and add to the dye, with six ounces murio sulphate of tin: mix them well with the dye, then dip and run the goods with the reel, until the color pleases.

#### *No. 95. Light Clear Yellow, with Black-Oak Bark.*

Five pounds of yarn: Boil in fair water, for fifteen minutes, ten ounces black oak bark; then take up the bark, and dissolve five ounces alum and five ounces cream of tartar, and add to the dye; mix them well in the dye, dip the goods, and run them with the reel, until the color pleases.

#### *No. 96. Madder Red, with Nitrate of Tin.*

Five pounds yarn: Fill the dye-kettle with fair water, to which add three pints wheat bran. Mix it well with the water, and, before it boils, skim off the bran; then dissolve half a pound alum and five ounces crude tartar, and add to the dye, with two and a half ounces nitrate of tin; mix them well with the dye, cool the dye, if boiling, with a bucket of cold water, and dip the goods; run them carefully with the reel, and raise the

heat; bring the dye to boil, continue this process of reeling the goods slowly, through the dye, and boiling slowly for three hours; then take up the goods, and air them; pack them in a close heap, and let stand forty-eight hours to sour; then empty the kettle, and fill half full with fair water, to which add three pints wheat bran; raise the heat and proceed, as before, to mix the bran and water together, and when it comes to boil, skim off the bran; then fill up the kettle with water, raise the heat to about the scalding point, dip and run the goods three times through the bran water, take them up and air them, fill up the kettle and add one pound Madder, and let it stand at scalding heat one hour; then dip the goods and run them carefully, with the reel, one hour, with the heat increasing, being careful that the dye does not boil; then stop the fire, but continue to run the goods fifteen minutes longer; then take them up air and cool them.—Shift the dye from the kettle and fill with fair water, to which add bran, and proceed as before: and when the water is nearly to boiling heat, and the bran skimmed off, add one and a half pounds madder, and regulate the heat, so that the dye may remain a little above scalding heat, for forty minutes; then dip and run the goods one hour, raise the heat and let the dye boil five minutes, then take up the goods, and wash them in strong soap-suds, and dry them as soon as possible.

This plan, for madder red, is something more troublesome than the common method; but those who wish to have fine colors, will be more than compensated for the extra labor, by the beauty of the color, which is but little inferior to scarlet, and more permanent.

#### *No. 97. Lac Scarlet. Five Pounds Wool.*

Boil in fair water, for fifteen minutes, two ounces black-oak bark; then add eleven and a half ounces lac dye, with seven ounces nitrate of tin, and three and a half ounces cream of tartar; boil and stir this mixture ten minutes, then stop the boiling, by adding cold water; dip and run the goods until the color pleases. While the goods are warm rinse in water.

No. 98. *Note:* In all cases, the lac must be reduced to a considerable degree of fineness, by cutting or breaking, and well mixed in a stone crock or jar, with the nitrate of tin, that it may be dissolved, which may be ascertained by rubbing it on a piece of glass or white paper, and before adding it to the dye, thin the mixture, by stirring it well with warm water.

#### *No. 99. Crimson, with Lac.*

Five pounds of yarn: fill the dye kettle with fair water, and bring it to boil; then add to the dye ten ounces lac, prepared with five ounces nitrate of tin, as above directed, and boil and mix them five minutes, then add three and a half ounces cream of tartar, and boil five minutes more; mix the dye well, and dip the goods; handle them regularly, reeling and airing them, until the color suits; then take them up and rinse in water. Next make a

strong soap-suds, and handle them through it, as hot as you can bear it to your hands; then wash out the soap suds and dry it.

*No. 100. Orange, with Lac.*

Five pounds yarn: fill the dye kettle with fair water, and bring it to boil; add five ounces black oak bark, and boil fifteen minutes; take up the bark, and add four and a half ounces lac, prepared with five ounces nitrate of tin; mix this well in the dye, and add four and a half ounces cream of tartar; boil a few minutes, dip the goods, and run them carefully in the dye, until the colour suits; then rinse and dry them.

No. 101. It is necessary, in all dying, to have the goods perfectly clean. They must not only be cleared of grease and filth of all kinds, but the soap-suds must also be well rinsed out of them, and especially, for those colours, that depend on acid of any kind for their brightness: such as *reds* of all shades *orange*, *crimson*, *greens*, and *yellows*. Although some of these colors may be improved, by taking them through a course of soap-suds after they are dyed, yet the same soap-suds, if applied at the commencement of the process, would injure the color. If the soap suds used to set a common madder red, were in the goods at the aluming, the alum might as well be omitted, for the reason that, the alum and soap would neutralize each other. For the same reason, hard water is unfit for the red dye; the lime contained in it produces the same bad effect, that is produced by soap-suds. To avoid this bad consequence, wheat bran is used, the lime unites with the mucilage, formed by the bran, and when the heat rises to a certain point, it is raised to the surface of the liquor, and skimmed off.

No. 102. Bright red, and a yellow brown, are the only colours contained in madder. The red is easily extracted, by water, at scalding heat; whilst it yields the brown colour but partially, until the dye is brought to boil: and although by boiling more color is obtained, one pound good madder being sufficient, in this way, to give three pounds yarn a pretty full color, yet the objection of being a dull brown red, is sufficient reason, where a bright colour is wanted, for using half a pound madder to each pound of goods, and avoid boiling, as directed in the receipts for making madder red.

No. 103. It is stated in the introduction that, all colors, in which copperas is used, may be dyed in iron vessels. These dyes, however, in which oil of vitriol, nitric acid or muriatic acid, is used, form an exception to this rule. Any of the preparations of tin or indigo, with those acids, would rust the iron so much, as to spoil the dye and spot the goods.

*No. 104. Indigo Blue.*

Prepare a vat of six gallons; let it be substantially made of wood about two feet in height, and tapering towards the bottom; an iron hoop should



be made to fit inside; and pass down easily, within four inches of the bottom. Some network should be stretched over the hoop, and three cords attached to it, at equal distances from each other, and long enough to extend from the top of the dye tub, to within four inches of the bottom.—The hoop is intended for a movable second bottom, in the dye tub; the network, stretched over it, is designed to prevent wool, yarn, or other goods, while coloring, from sinking to the bottom of the vat, and mixing with the sediment; and the cords are used for the purpose of raising the hoop out of the tub, when it is necessary to mix the dye, and being fastened also to three pins, near the top of the tub, they prevent the hoop from sinking, within a less space, than four inches of the bottom.

#### No. 105. *To Set the Vat.*

Put five gallons old chamberlye into the vat, to which add half a pound good Indigo enclosed in a bag; two ounces potash and two ounces good madder; stir and mix all well together; let it stand twenty-four hours, then add half a pint wheat bran, and rub out one fourth of the Indigo into the dye; mix the dye well, and let stand twenty-four hours longer; by this time the dye should be fit for coloring, which is known by a rich copper colored scum on the top of the liquor, a heavy froth of a beautiful purple color when the dye is strongly stirred; the dye having a fine yellow green color, when dropping from the end of a stick, held between you and the light. If a sample be dipped a short time in the dye, it should come out a fine green, and change to blue, after a few minutes exposure to the air.

No. 106. When the dye presents all these signs, the dyeing may be commenced. But if the vat has not yet come to work, stir well every three hours, and keep the vat closely covered at all times, except when you are at work with the dye. Attend it in this way, until the vat comes fully to the description given above.

Put down the hoop and dip the wool; let it remain five or six hours; then take it out, and as this is done, wring out the dye into the vat, and open out the wool to air; then take up the hoop, and mix up the dye, thoroughly, and let it stand, at least one hour, before the wool is returned to the dye; proceed in this way, and you cannot fail to have a fine blue.

No. 107. When the dye becomes weak, renew it by rubbing out more Indigo, and adding a little bran and madder; and if it colors very slowly, put up two gallons good wood ashes, with two quarts stone lime, apply as much chamberlye to the ashes, as will run off two gallons of lye, mix one quart of this lye, when you rub out the Indigo, and mix all well together.

No. 108. Be carefull to discontinue the coloring, at any time that the dye fails to exhibit the signs, of being in good order, as given above.—

The principle reason that good blues are not always obtained in this kind of vat is, that the coloring is frequently continued, when the Indigo is floating undissolved in the dye. When this is the case, the wool instead of being green as it comes from the dye, is almost as blue as when it was put in; the Indigo, adhering to the wool in the state of a fine paste, is removed almost entirely, the first time that soap and water are applied to it, and the vat is rendered worthless, until renewed again, by the addition of more Indigo.

No. 109. Another cause of failure is, crowding too much wool in the dye, at the same time. The idea that, an ounce of Indigo will produce more color, if used in two gallons of dye, than in five, is erroneous. The Indigo is as readily dissolved in the one case as in the other; the wool, if well dyed in two gallons, must be divided into seven lots, and the work is done to disadvantage; or if colored at once, the dye will be crowded to excess, and you will fail in making a good color, and spoil the dye. But in the case of five gallons, the wool is dipped at once, and having room enough, the color will be uniform, obtained in less time, and a better blue.

No. 110. Another cause of indifferent colors. There is no blue dye, in which the Indigo is all perfectly dissolved at the same time, the particles of Indigo, that remain undissolved, will settle to the bottom, if time be given for that purpose; if not they remain suspended in the dye. In either case, when the wool is dipped these undissolved particles of Indigo, adhere to, and are taken out, with it, and lost entirely; and what is worse, it adheres to every thing, that is so unfortunate as to come in contact with the wool, until it is washed.

This evil is altogether remedied, by letting the dye stand to settle, about one hour, each time it is mixed; and then letting down the hoop, or second bottom, before the wool is returned to the dye.

Frequently the dye fails, in consequence of bad Indigo; but this is no reason why the color should not be good. The remedy for too light a color is found in using better Indigo. There is no reason for throwing out the dye, or leaving the color unfinished.

This kind of blue vat would impart a good blue to wool, or yarn, in less time than it commonly does, if it could be kept about milk warm. For this reason, it should be used only in the warm season of the year, and if set nigh to a wall, that faces the sun at twelve o'clock, the heat will be considerably increased.

The size of the vat, is always regulated, by the quantity of goods to be coloured. There is a great disadvantage in using one too small; the expense of a vat, to hold ten gallons, and one that holds but three, is about the same, whilst it will be found that, ten pounds of wool can be dyed with less labor and less cost in a vat that holds fifteen gallons, than in one that holds but five; and when done is better in color, and in every way else. If there were no other reason for this, than being accomplished in less than half the time required, to make the color in the small vat, it would be a sufficient one.

In case the pearlash should not be at hand, for setting, and recruiting, the dye, a few quarts good lye will answer the same purpose; indeed, so simple is this kind of blue dye, that a good color can be made, by rubbing

out the indigo with the chamberlye, and letting it stand a proper length of time, to dissolve. No person, however, unacquainted as they may be with the art of coloring, can fail with this dye, if the foregoing directions be attended to.

In conclusion, a few remarks may be necessary. If the preceding receipts had been prepared for the exclusive use of practitioners, the Author would have expected to be understood, with much less labor.

Being designed especially, for the benefit of those, who are unacquainted, in a considerable degree, with the art of coloring, plainness has been studied throughout. In making colors, airing the goods is an indispensable part of the process. None but those experienced in dying, are apprised of the effect produced by the air, on colors while in the process of dying. This is all the apology the Author offers for recurring to this necessary part of the process, in each of the receipts.

In a few cases, the goods are directed, (after being cooled) to be packed up closely, and remain so for a given length of time. This is done, in order that the acids, in which they have been immersed, may penetrate more fully into the pores of the wooll, and become incorporated with the body of the goods.

All the receipts are adapted to five pounds of goods, on the supposition that, this arrangement was as good as any that could be made; for any other quantity of goods, the necessary calculation is easily made.

### Washing of Wool.

The rinsing box is made by fitting up a box, about two feet in length fourteen inches in breadth the same in height, and open at top. To be water tight is no disadvantage. Mark one end No. 1, and the other No. 2; nail a cross piece in the bottom, at No. 1, four inches in breadth, dress a board to fit inside of end No. 2, nail a ledge one inch square on the side, and even with the edge of this board; leave it eleven inches in breadth, then nail it fast, level with the top of the box, and three inches inside of end No. 2, with the ledge fronting the cross piece at No. 1. Then fit in half inch square strips, resting one end of them on the cross piece, at No. 1, and the other, on the square ledge of end board at No. 2; nail them down, leaving a space of one fourth of an inch, between each strip: Cut a six inch square hole, through the outside end at No. 2, to which attach, on the inside, a gate to fit closely. This second bottom answers the purpose of a strainer, or sieve, through which the water passes out freely, while the wool is retained.

If you have a spring run, or any other stream of water, in which a spout can be so arranged that, there may be a few feet of fall, where the water leaves it, your washing of wool can be better done, and with less labour, than without this convenience. Set your kettle, as nigh to the water as you can; fill it with water, and chamberlye, to within a few inches of the top, in the proportion of two parts of the former, and one of the latter; heat so that, you can just bear the hand in the liquor, without being scalded; put in the wool, and let it remain until the dirt, and animal oil, separate freely from it, which can be ascertained, at any time, by taking up a sample of the wool, and wringing it tightly. If the wool be in order for rinsing, the filth will run off easily, leaving the wool white; or try the same

ple in cold water. If the filth leaves it by being slightly rinsed, leaving the wool perfectly white and open, take it up, and put another lot of wool in the kettle; and while it remains in the hot liquor, move the basket of wool, just taken up, to the rinsing box; throw in the proper quantity, let on the water, and with a stick stir the wool, in the box; then draw the gate at No. 2, when the water is run off close it again, and let the water on the wool, stirring as before. Continue this process, until the wool be perfectly clean, being mindful, not to let the lot, in the kettle, remain there too long, or the heat to come to the scalding point. Proceed with the second lot, as in the first case, and as the liquor, in the kettle, is reduced, fill up again with chamberlye, and water in the same proportions as at first.

In this way, a large amount of wool can be well washed, in a few hours. If limestone water be used, it may be necessary to add, to the mixture in the kettle, a few quarts of good ley; soap is sometimes used for this purpose but is not good--the ley is preferable, as it contains no grease.

Unless the chamberlye has, at least, six months age, it will be necessary to use a larger proportion of it, than one third. When the wool is put into the kettle, it must be carefully mixed with the liquor, that it may penetrate all parts of the wool equally; and for the same reason, care must be taken, not to put too much in at once. After the wool has been carefully mixed, in the kettle, all that is necessary is, to take it up at the proper time, and rinse it in clean water. Where water is not convenient, it would be better to move the wool, and washing utensils, a mile, than to be without the use of a spout, as before described. When the wool is washed, it should be dried, as soon as possible; and while this is doing, care should be taken to protect it from rain, and heavy dews. Wool is better lying in a heap, though wet, than exposed to heavy dews or rain: both have a tendency to render it harsh.

There are several other means of washing wool, and most of them do more harm than good. Between hot soap suds, rubbing, and tramping the wool, it is frequently spoiled, or left in such a condition that, neither the carding, spinning, or weaving, can be well done; and after the job has cost more, every way, than was necessary, it does not answer the purpose, for which it was intended:—and all this loss, and disadvantage, growing out of the bad handling the wool got, in washing and drying.

In short, the washing of wool is, at the foundation of our manufacturing; and after the breed of sheep, or quality of wool we use, is next in importance.

This method of washing wool, ought to have preference over those, in common use, if it was for no other reason, than the ease with which wool is prepared for carding, when washed in this way, compared with the difficulty with which wool is picked, after being washed with ley or soap.

There is another disadvantage in washing wool indifferently, of which few persons appear to be aware. Fine wool contains from twenty-five, to fifty, per cent, of animal oil, and other matter, of which it must be divested, before it is fit for clothing.

Amongst the several processes, through which wool passes, from the fleece to the finished cloth, there is none so suitable for cleaning it of all the filth, as the first washing, after coming off the sheep. Through neglect in this operation, thousands of packages of wool are annually carded in our country, with the washing so carelessly did, that from fifteen, to



twenty, percent, of the weight of the package, is made up of foreign matter. One of the consequences is that, the cost of carding is increased, from seven, to five, percent, to those who have it done; for the plain reason that, they pay for carding filth instead of wool. Another consequence is that the carder is compelled to spend one third more time, in doing the work, than would have been necessary, if the wool had been in good order; and still the spinner has, perhaps, just cause to complain. There are many, who succeed in washing their wool clean, with lye or soap; and yet are losers. There are a brittleness and harshness imparted to wool, by this kind of washing, that is an injury in carding, spinning, and weaving. If the washing be done with old chamberlye, the wool is open and elastic, easily picked, and carded; and with good carding, there must be very bad management in spinning, or the yarn will be good.

The weaver then has no difficulty, in putting up the work, as it should be in the loom. Indeed, if this first operation in manufacturing, be properly conducted, one half of the difficulty, in making a good job, of all the rest, is overcome, and this should be sufficient inducement, to every person manufacturing for their own use, to adopt the best plan for washing their wool; every part of the work afterwards is much easier done; and the web, when finished, will have cost less, in both money and labour, whilst, at the sametime, it will be more valuable.

If the coloring be done in the wool, it is yet more important that lye or soap, should not be used in washing. Neither of those articles can be used, in this way, without imparting an injurious harshness to the wool, which is increased by coloring, to such a degree, as to make it doubtful whether, the carding, and spinning, could be well done.

The coarser qualities of wool, are commonly manufactured, without any other washing than simply in water. In cases where the colors are to be made in the wool, it is important that, the wool should be well washed; it is impossible to make colors, either bright or fast, unless the pores of the wool be cleared of all filth and oil.

This is one reason that, the blue vat, so frequently disappoints the expectations of those, who are dying blue; the dye is always strong enough to extract whatever oil, or grease that may be contained in the goods; but not always strong enough to perform this office, and the one for which it was intended.

### Mixing of Colours.

Dark Steel mix, is composed of nine pounds black, and one white wool.

Light Steel mix, two parts black, and one of white.

Gray is made, by mixing equal parts of black, and white wool.

Light Gray, two parts white, and one of black.

Dark blue mix, two parts blue, and one of white.

Middle blue mix, equal parts of blue and white.

Light blue mix, two parts white and one of blue.

A great variety of different shades, of mixed colors, may be obtained, by changing the proportions, and colours used.

A very good color is made, by mixing equal parts of blue, black, and white; and a color equally good, by mixing one pound blue, one of black,



and two pounds white; and if the colors be deep and full, a good mix is made, with one pound black, one of blue and four of white.

† Excellent colors are also made, by different combinations of black, brown, and blue. For instance, color a lot of wool brown, according to receipt No. 14; then take half this lot, and dye it black as directed, in receipt No. 3; dye another lot blue, as directed in receipt No. 105; mix these in equal proportions, and you will have a beautiful permanent color. Or make the brown, and black, as above directed, and mix equal parts of black, white, and brown. Good colors are also made by mixing blue, and brown, equal parts of each, and black and brown, in the same way.

The limits prescribed to this work, do not permit the author, to enter, more fully upon the mixing of colors; though much more might be said, the good sense of those, who are interested, will, no doubt, supply this defect.

A few remarks have already been made, on the advantages of making colors in the wool, over that of dyeing in the web, to which many more might be added. Indeed, so unconditionally has public opinion, and experience, decided on this subject, that, all manufacturers, of woollen cloths, are compelled to furnish conclusive evidence, that their cloths are dyed in the wool, or have them remain on hand unbaught.

This is one reason that, all broad cloths are finished with *listings*, or *selvages*, of different colors from those of the cloth.

No person, who makes a business of buying cloths to sell again, would purchase broadcloths dyed in the web, if he could get them at half the cost of those dyed in the wool, unless he intended to do an itinerating business; for the reason that, his customers would leave him, as soon as they discovered the bad quality of his goods. If an article be so universally condemned for its bad qualities, we are certainly furnished with sufficient reasons, for not making the same article, for our own use; and that too, at more cost than would furnish an article of good quality, from the same materials.

But to be more particular: suppose, for example, that twenty pounds of wool be manufactured into cloth, and sent to the fulling mill and dyed in the web, a snuff-brown; if finished in the best style, the fuller's bill will be twenty-five cents, per yard, for twenty-two or three yards. If dyed in the wool at home, and fulled and finished in the same style, the fuller's bill will be twelve and a half cents per yard, leaving two dollars and seventy-five cents, for the coloring. Turn to receipt No. 5, and it will be found that, the cost of dye-drugs, for twenty pounds of wool, cannot exceed seventy-five cents, leaving two dollars for the labour in this case; and a color that cannot be surpassed for good qualities by any in this class. But when the difference in utility is considered, there is no comparison: in the one case, the wool is oiled shortly after it is dyed, to prepare it for carding, and remains so until cleansed by the fuller in washing. The soap and water, that are necessary to remove the grease, loosen and carry off every other impurity with them, and the wool is left soft and elastic, as when growing on the sheep's back. The color once permanently fixed in the pores of the wool, and uniform through the whole body of the cloth, it must continue the same while the cloth lasts.

But on the other hand, the cloth being dyed after it is fulled, it is not possible for the color to penetrate the centre of the cloth, as fully as the sur-

face; and is deposited more in the pores of the cloth, than in the pores of the wool; and what is still worse, is perhaps only washed in cold water, after the coloring is done. It is impossible for a garment, made of such cloth, to be worn any length of time, and continue to be uniform in color, for the plainest of all reasons—the wear is unequal, reducing some parts of the garment faster than others, and as the surface approaches the centre of the cloth, by wear it is found to be light in color, while those parts of the garment that are subjected to less wear and exposure, perhaps become darker, for a time, from the action of the air.

But these are not the only objections to colors dyed in the web. The cloth will not wear as long as when dyed in the wool. No person, acquainted with this subject, need be informed that, copperas, as well as blue vitriol, possesses strong corrosive properties, in consequence of which, they tend always to impart harshness and brittleness to goods, and this injurious tendency must either be counteracted, by neutralizing their corrosive properties, or incur inconvenience and loss.

If any person has doubts, on this subject, they can have sensible demonstration of the fact above stated, by simply bathing their hands in a solution of either of those articles: and the remedy for the corrosive harshness and contraction, imparted to the skin, by the above experiment, is so simple and natural that, any person would apply it, at first thought,—oil, soap, and water, just what has been recommended, to counteract the same evil in manufacturing. Another consideration, of great importance in the wear of woollen cloth, in consequence of the harshness just alluded to the cloth, is more open in texture, than it should be; the dress on the face side, after being in use a short time, instead of lying smoothly, as it comes from the press, rises up and curls about, the points of the wool standing in every direction;—precisely like the hair on a hidebound horse. The consequence is, there is no possibility of keeping such a garment clean; the dust penetrates, constantly, into the body of the cloth, and increases the harshness, brittleness, and wear, until the garment becomes uncomfortable, and is thrown aside as useless, the color faded, and the cloth rotten before it should have been more than half worn out.

Cloth, dyed in the wool must, in the nature of the case, pass through such a course, in manufacturing, as will take off the harshness imparted to the goods in coloring, by neutralizing the corrosive properties of the dye drugs. The cloth, then, acquires the proper body, in fulling is left close and compact in texture, the wool, being soft and elastic, is prepared to receive the proper finish, of which a better idea cannot be given, than the coat on a slick horse. This serves as a covering to the body of the cloth, and protects it from being penetrated and filled with dust, and the beauty and durability of the article depend, in a considerable degree, on the length of time this covering continues, in the position given it, by the clothier. And while it is a notorious fact that, cloth dyed in the web retains, in many cases, the finish but little longer, than the spunging operation at the tailors shop. It is also equally evident, from experience that, cloth dyed in the wool retains, in many instances, the beauty of its finish, though frequently washed until it is entirely worn off. On the whole, the fact is evident, from reason and experience that there cannot be less than twenty-five per cent difference, between the two articles in favor of coloring in the wool, amounting in the lot taken, for example, to eleven dol-

lars and and twelve and a half cents. The cloth is set down at one dollar peryard, the tailor's bill at fifteen dollars, for making five coats, and the trimings at one dollar and fifty cents each. The whole calculation is founded on the doctrine that, the coats, in the one case, will yield one-fourth less actual service, than in the other: a fact that will be established in every case, where the test of fair experiment is brought to cast her light on the subject. This is the only reason why our domestic mixed cloths, whether made in whole or in part of wool, out wears any others. The wear of our mixed blue cloths, sattinets, and lindseys, is almost proverbial; and so far as mixtures of blue and brown have been tried, they have been found equally good: and the same will be said of all the rest, so soon as experience has fairly tested their value. All that has been said, in reference to colors dyed in the wool, applies, with strict propriety, to this class of cloths; and the whole secret of their extra durability is found, in the fact that, oiling, fulling, and washing, neutralize the corrosive tendency of the dye drugs, used in their manufacture.

### Preparing Wool for Carding.

On the subject of carding, little can be said, as the author does not design to instruct carders, but rather to give such directions to those having the work done, as may promote their interests.

The first consideration is, to have the wool in good order: and nothing tends more directly towards this desirable object, than careful washing. Wool is frequently so much injured in washing that, the carding cannot be well done; and this is almost invariably the case when ley or soap is used. Sometimes the wool is wet in'a tub, with soap suds or weak ley, and rubbed or tramped, in order to loosen the filth; the consequence is, the wool is ruined. An operation of this kind, continued for two minutes, will spoil the best lot of wool.

It often occurs that, good wool contains considerable of second growth, which is made to adhere to the wool around it, and felted so closely together, by the above treatment, that, in carding, it can neither be separated from the wool, to which it is attached, or carded into good rolls, but remains in the work, in the form of small lumps of very short uncarded wool, and is considerable injury in spinning.

On this account, if no other, the method heretofore recommended ought to have preference, for the reason that, it has less tendency to full the wool, than any other, and leaves it so open and lively that, the second growth and second clipping, do but little injury in carding or spinning.

Another advantage, in carding from this kind of washing, is,—there is more or less wool, in every fleece, injured by filth and and exposure to the weather, and appears dead, or to have lost its elastic property. This method of washing removes the filth, entirely, and restores the strength and elasticity of the wool, in a much greater degree, than any other known to the author. It also leaves the wool so open, and lively, that the labor of picking is reduced, more than one half. And if, in saving time, an equal advantage is not realized by the carder, and spinner, one of more importance is secured to the owner, by the superior quality of the rolls and yarn.

The washing being rightly done, and the wool cleared by picking of burrs, and other substances that would injure the machinery in carding, the rest remains with the carder.

An opinion that, wool is frequently too much cut or shortened in carding, is erroneous. In all cases, where the wool is intended for fulled cloth, if the carding could be done in such a way that, no fibre in the package would exceed an inch in length, it would be all the better;—the cloth would be better in every respect, and more especially so, in all cases of long wool. —If any doubts be entertained on this subject, they may be removed by unraveling a bit of good cloth, and by this easy experiment it will be found that, the wool had been very much shortened by carding.

Gnarling the wool, in carding, is a great injury, and is commonly charged to account of too much carding; but nothing can be further from the fact.—Bad machinery, or what is about the same thing, machinery in bad order, or the careless manner in which the machinery is attended, are the true causes, with these already noticed, in preparing the wool, of all the vexation and loss, annually inflicted on the public by wool, being thus injured, in carding.—And the proper remedy, in every case of the kind, is to withhold all patronage from those, who thus prove themselves unworthy, of this kind of public trust. And indeed this corrective is reasonable, in every point of view, if the expense incurred in the purchase and fitting up of good machinery, and the toil of careful attention to business, reap no better reward, than is bestowed on the parsimonious, and negligent in business, and we must take the consequences of a bad choice, if it should be a lot of badly carded wool. The great difficulty in getting wool of different colors, properly mixed in carding, has prevented, to a considerable extent, the manufacture of mixed cloths, and must continue to injure this useful branch of home industry, until the picking machine is brought more generally into use. By the aid of this useful and cheap machine, all difficulty in mixing different colors, is easily overcome; and, for several purposes, this machine is so convenient and useful that, no carding room should be without one. Wool is not only better prepared for carding, by being passed a few times carefully through a good picking machine, but all the inconvenience of working several kinds of wool together, is avoided.—Although in the manufacture of fulled cloth, of all descriptions, different grades ought not to be mixed together, as a few pounds of coarse would be an injury to a large lot of a better quality, yet different kinds of wool, if equal in fineness, may, in many instances, be advantageously carded together, and coarse wool and fine, for many other purposes, may be usefully employed together. But in all cases, of this kind, a good picking machine is indispensable.

### Spinning.

Spinning is an important branch in the manufacture of woollen goods. Their beauty and durability depend, in a considerable degree, on the manner in which this part of the work is performed. In all spinning, intended for fulled cloth, the yarn ought to have twist enough to weave well, and no more. Any thing, more than this, is not only unnecessary labour, but an injury. It prevents the cloth from acquiring that compact and firm texture, in fulling, that is essential, in order to a good piece of cloth and a handsome finish. But the opposite extreme is attended with worse consequences, and leaves the thread too soft and weak, to stand the wear of weaving; a matter of great importance in the manufacture of woollen cloth.—

An opinion that, the chain ought to be *hard* twisted, and the filling *soft*, is founded on a wrong view of the subject, as will appear when fulling comes to be treated of. It will be readily admitted that, cloth made in this way, will receive a good finish, with less labour, than when the chain and filling are twisted alike; but good reasons can be given, notwithstanding, why it ought to be avoided by all, who are manufacturing for their own use. A more correct opinion prevails, pretty generally, and is founded on experience that, the work as it comes from the weaver, should be square; *viz*, have as much filling as chain, in each square yard, for the very good reason that, the best wearing flannel is woven in this way.—And for the same reason it will be found, that cloth, when finished, ought to be square also, which is impossible, where the difference, before spoken of is made in spinning. But whatever difference, either in chain or filling may be thought best, in the way of twist, it should be equal in all parts of the web. If hard and slack twisted yarn be striped together, in a piece of cloth, it will be found to shrink, unequally, in fulling; the soft twist will be narrow and the hard twist wide, and the cloth will be puckered and spoiled. The degree of fineness, given to the goods by spinning must be left to the taste of those in charge of the work. The beauty and utility of the cloth, depend, in a greater degree, on the quality of the wool, and the perfection given to each particular process, in the progress of the work; beginning with the fleece, and ending with the finished cloth, than on the fineness of the thread, of which it is composed. For Satinets, the wool should be spun fine, and with just enough of twist, to follow the shuttle in weaving. This will enable the weaver to put the work well together in the loom, and the value of the article depends, very much, on the manner in which this duty has been performed.

Spinning for Lindseys, to be fulled for men's wear ought, also, to be softly twisted; and in no case, a finer thread than ten cuts, to the pound. Flannels, to be colored in the yarn, should be spun with a firm well twisted thread, otherwise the washing and dying will leave the yarn too open and weak, to weave well.

Blanketing should be spun coarse, about nine cuts to the pound, and twisted enough to wear well, and no more.

## Weaving.

Amongst the several processes, by which wool is converted into cloth, of the various kinds that minister to our comfort, or convenience, it may be said with propriety that, weaving ranks with the most important. The others are necessary for the purposes, for which they are intended; but in each case, the office, performed by the weaver, renders them valuable or otherwise, in proportion to the degree of perfection, at which he arrives with his task.

And this is literally true, in all weaving, designed for the fulling mill.—The imperfections and faults, in weaving, may be covered to some extent by the fuller, but they cannot be removed. If woven too thin, the cloth when finished, will be deficient, either in body or in breadth; and if woven unequally, the fulling increases the evil, the cloth will be puckered, and can neither be finished, made up or worn with any degree of decency.



All weaving, intended for fulled cloth, should be uniform, in thickness, from end to end of the web, and as nigh square as possible, having as much filling as warp in each square yard; and supposing the yarn twelve or fourteen cuts to the pound, it should be woven in a six hundred reed, and geers, the cloth, when woven, being forty-four inches in breadth.

For Lindseys to be fulled, the warp should, in no case, be finer than No. 9. No. 8 cotton yarn is better, the filling soft twist, and not finer than ten cuts to the pound, of which five cuts should be woven into each yard, the cloth should be forty-four inches in breadth, and uniform, in thickness, throughout the web.

The breadth that flannels are woven, is not so particular, as they undergo no shrinkage in fulling. They should in all cases, except for linings and inside clothing, be woven closely, as the beauty and durability of this excellent article of dress, depend, in a great degree, on being well put together in the loom.

Satinetts should not be woven on a coarser warp, than No. 16, No. 18, to 22 is preferable; the filling should be fine and softly twisted, of which, from ten, to fourteen ounces, should be woven into each yard. As the shrinkage in lindseys and satinettes, in fulling, is all breadthwise, it is very important that, the weaving should be uniform as possible.

### Fulling.

There is no part of the work, that requires more care, or honest faithfulness, than the fulling and finishing of country cloth. A small neglect or omission, in any part of the work, is always attended with considerable loss, and inconvenience to the owner. If the cloth be neglected in the mill, when first put to work, the consequence will be that, in thousands of places, the folds of cloth are fulled together, and it acquires a rough, creased, appearance, that is very injurious, both to the appearance, and usefulness of the cloth. Frequently, the cloth is fulled in the grease, as it is called; *viz*, the grease and filth are not washed out of the goods, until the thickening process is completed. In this way, the work is always badly done, the cloth is never so firm, compact, and uniform, in texture, as it should be, and what is worse, is not clean. And to increase the difficulty, the coloring is yet to be done; the dye, uniting with the grease, and animal oil remaining in the goods, forms a resinous substance, distributed through the whole body of the cloth.

A garment of such cloth, is stiff, cold, and uncomfortable in winter;—and in summer, or in a warm room, is disagreeable, in consequence of the offensive smell emitted from it. Dust and dirt adhere to it, and become united with the glutinous impurities left in the goods, by the fuller, until the garment becomes so disagreeable, and uncomfortable, that it is thrown aside as worthless, before it should have been more than half worn.

On the whole, fulling cloth in the grease, is such a bad practice that, those who get their work done, in this way, are always losers, to more than double the amount of the fuller's bill;—and the imposition is so gross and palpable, that it cannot stand a moment's inspection.

There is not a good housewife in our country, but would dismiss her washer-woman, immediately, if, in her line of business, she attempted an imposition of this kind.—She is expected to take the clothing through two courses of washing, and then through a careful rinsing. While the fuller for the paltry consideration of a cent less per yard, in his bill, is permitted to practice an imposition of the same kind, that deprives us of the value of our labour, and the comfort of our clothing.

In fulling cloths, satinetts, and lindseys, the first thing to be done, after carefully burling them, should be to clear them carefully of the filth and grease. Old chamberlye is the best, and cheapest article, that can be used for this purpose; and if soft soap be added, it should be of the best quality, and have, at least, one year's age.

The cloths should then be dried and carefully burl'd again, removing all the knots, and other defects that would injure the finishing. They should then be taken through a second course of fulling, with good hard soap, that has been well made, and properly cleared of lye. By this process, we accomplish several valuable purposes; by washing, in the flannel, we succeed easily and certainly in getting the goods clean—and being clean, the wool unites, in the second process, closely and uniformly together, forming that compact and firm texture, that is essential to all well full'd, and well finished cloth.

### Finishing.

When cloth has been well milled and finished, in a proper manner, it will be soft and firm; being shorn even, it will present a short thick knap, which lies smooth and regular in one direction. By drawing the hand over the cloth, in the way the knap inclines, it will feel slick and smooth; by moving the hand in the opposite direction the knap will feel rough and prickly. If the cloth will bear this inspection, you may conclude the finishing is right; but if the cloth be hard and stiff, if the knap be irregular, and the face of the cloth rough, the workman has not performed his duty, but has endeavoured to hide his neglect or failure, by hard pressing. The press on cloth is of little importance. It should be so dressed as to wear as neatly without, as with pressing, the only reason that thick cloths are pressed is, to settle the bodies of the wool, and make the threads uniformly smooth and compact.

A great proportion of the people, being unacquainted with the clothier's and dyer's art, are generally satisfied, if their cloth present a flashy and fanciful color, and come stiff from the press; but the stiffness which the cloth has acquired, from a hot and close press, is designed merely to conceal the faults of the finishing and it will be found, on wearing such cloths that, the color will soon fade and the cloth become rough and appear coarse; which, if the goods had been well colored and dressed, would have worn smooth, as long as the garment lasted.

## Washing Yarn.

This is best done in a mixture of old chamberlye and water, one-third of the former and two-thirds of the latter, in sufficient quantity to immerse the yarn without crowding, and as hot as the hand can bear. In this mixture immerse the goods, and let them remain without any handling whatever, until the grease and filth will rinse out easily; then take up the yarn and ring it, over the tub, as dry as possible; then rinse clean, in cold water. If the chamberlye be not old, it may be necessary to mix it half and half with the water, and perhaps to add soap; but all rubbing and stripping should be avoided. In this way yarn can be washed perfectly clean, without fulling it together in the least—a matter of importance, if the yarn be to be colored. In the common way of washing yarn, it is frequently fullled together, to such a degree that, neither the madder or blue dye can penetrate the inner part of the skein, so as to make a uniform color.

## Drying Wool.

This ought to be done, if possible, in the shade. It will be found that, wool protected, whilst drying, from rain, dews, and sunshine, will feel much softer and finer than if exposed to the weather; but if the drying cannot be done indoors, in reasonable time, it is better to spread it in the open air, than to let it remain long wet, as this always renders it harsh and brittle.

Nearly all the preceding receipts, except those for reds, greens, oranges, crimsons, and yellows, are made out for five pounds of wool; but by using one fourth less dye-drugs, will be found to answer the purpose equally as well, for five pounds of cloth, flannel, or yarn.

## Indigo Blue, on Cotton or Linen.

Grind half a pound good Indigo, very fine, and mix it well with half a gallon strong ley: after standing twelve hours, fill the blue vat with clean water, within a few inches of the top—rain water is best, to which add three pounds good unslacked lime, have one pound copperas dissolved, and add with the lime; then add the Indigo and stir the whole well together, and cover the vat closely. In four hours stir the dye well again, and continue to mix and stir up the dye, thoroughly, four or five times a day, keeping it closely covered at all other times, until it be fit for coloring.

When this is the case, a fine copper colored scum covers the surface of the dye, a heavy flurry or froth of a deep blue rises to the top, when the dye is stirred, and the dye is a beautiful yellow green when dropping between you and the light. When the dye presents these appearances, the coloring may be commenced.

Sometimes this dye is fit for use in a few hours; at other times, it is several days coming to work. This difference is owing to the weather, the quality of the Indigo, water, or lime. But in all cases, the dye will come right sooner or later, if attended to according to the above directions.

### **The Vat.**

This should be made on the plan recommended at page thirty-one, omitting the second bottom, and should be of sufficient height, to admit the yarn to hang by one end of the skein, at the top of the vat, without reaching the bottom by six inches. A ledge should be attached inside the vat, and near the surface of the dye, on which to suspend the yarn.—The yarn must be boiled in water, until it sinks before the dyeing is commenced; otherwise it will float on the surface of the dye, and will not take the color.

After the yarn is boiled, open out the skeins and wring them as dry as possible; then shake them up loosely, that they may hang open and loose in the dye, and run them on small sticks, (as you would candle-wick,) and dip them in the dye, leaving the ends of the sticks to rest on the ledge inside the vat. After the yarn has remained a proper time in the dye, take it up and wring it as dry as possible, shake up loose, and stir and mix the dye well, and let stand covered closely an hour and a half or two hours to settle; then dip the yarn as before; continue the process of dipping, wringing, and airing the yarn, until the color suits, and you cannot fail to have a fine and permanent blue.

This blue, if left light, may be changed, in the yellow dye, to a beautiful green. When the dye becomes weak, renew it with Indigo, copperas, and lime, in the same proportions that were used at first.

### **Orange, or Copperas Colour, on Cotton or Linen.**

Dissolve two pounds copperas in hot water, have the liquor very strong, and let it stand till nearly cold; then run the yarn into the copperas dye, one hour; then take up the goods and wring as dry as possible; shake up the yarn, to open out the skeins, and handle them through lime water; then let it drain and hang to air and sun, for fifteen or twenty minutes: continue to dip the yarn in the copperas liquor, as at first, and then in the lime water, and air and sun it each dipping, until the colour suits. If a very deep color be wanted, increase the strength of the copperas dye and lime water.

A much better and deeper colour can be made by using lime water, than in the usual way with ley.

The yarn ought to be boiled, as directed for the blue dye. Without this, it will not take any colour.

## **Black on Cotton, or Linen: Five Pounds Yarn.**

Make a strong dye of black-oak bark, to which add four pounds logwood, and boil well; then add five ounces blue vitriol, and dip and run the goods one hour; take up the yarn and add two pounds copperas to the dye, dip and run the yarn, as before; then take up the yarn and add three pints of good ashes, or three ounces of pearlash to the dye; stir well, and return the goods to the dye, and let it stand till next day; then rinse and dry it.

## **Logwood Blue on Cotton or Linen.**

Five pounds yarn: boil the yarn as directed for indigo blue; then dissolve six ounces blue vitriol, in which run the yarn one hour; then take up the goods and hang them out to air; add three pounds logwood to the dye, and boil well; dip the yarn, and let it lie one hour; take up the yarn and air it as before; add three ounces of pearlash and half an ounce blue vitriol to the dye, and mix well; then return the yarn to the dye, and let it lie one hour; take it up and air it. If not dark enough, return it to the dye and let it remain till next day; then rinse and dry it.



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| Finishing                      | - | - | - | -  | 43      | Green                     | - | - | - | 45 |
| Washing yarn                   | - | - | - | -  | 44      | Orange or copperas colour | - | - | - | 45 |
| Wool, dyeing of                | - | - | - | -  | 44      | Logwood blue              | - | - | - | 46 |
| Indigo blue on cotton or linen | - | - | - | -  | 44      | Black                     | - | - | - | 46 |



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